less resistance. New lines might indeed be opened out by fragments of metal, such as nails, &c., scattered by the explosions.

In the case mentioned above, it was difficult, without some such theory, to account for the breaks in the courses followed by the electricity.
E. H. Pringle

Bath, October 1

Gyno-Diœcious Plants

During the past summer I have found the following species in a gyno-diœcious condition, namely, *Ranunculus acris*, *R. repens*, *R. bulbosus*, and *Stachys germanica*, all of which have the corolla considerably reduced in size, and the stamens in *R. acris* and *S. germanica* either absent or reduced to scale-like bodies devoid of pollen. In *R. repens* and *R. bulbosus* the stamens are not so much reduced, but so far as I can judge they produced little or no pollen. The female form in *R. acris* is very common in Lancashire, but I failed to find any on the Lincolnshire coast although I searched carefully for it. In *R. repens* the female form is very rare, having seen only about thirty plants in all. I have also found the *Geum rivale* to be andro-monœcious. So far as I can ascertain these plants have not been noticed in the state described above.

Ashton-under-Lyne Thomas Whitelegge

Wasps Under Chloroform

A few days ago a friend told me that she had often placed a bee under chloroform, and that the victims when they found they must die invariably brought their stings to their mouths and sucked the little drop of poison into their mouths. She offered to show me the experiment and endeavoured to catch a bee, but failing to do so she caught a wasp, an insect upon which she had not previously experimented in this way, and we both eagerly watched to see if the wasp would behave as the bees had done under the influence of the narcotic.

The wasp being put under an inverted tumbler in company with a piece of paper saturated with chloroform, in a very few seconds the insect fell on its back and almost immediately afterwards curled up the tail with the sting protruded and a drop of clear fluid on the end of the sting. The sting was brought to the mouth and the drop of fluid disappeared. The wasp then became motionless. After a few seconds the tumbler was removed and the air allowed to play freely on the insect, but no sign of life appeared, except once a slight twitch of the wing. To test whether the insect was really dead my friend placed it in a butterfly cage and left it out of doors all night. Next morning the wasp had disappeared; having perhaps crawled out by a little chink in the cage door.

Can you tell me whether so curious an action of these insects when subjected to chloroform is well known? Does it fulfil any good purpose? Is the poison a narcotic itself and taken by the insect to dull its pains when death seems inevitable? The revival of the wasp appears to show that neither the chloroform nor the poison of its own sting is deadly to the insect.
W. M.

Clevedon, September 21

"Mercator" the Geographer

In Prof. Huxley's "Physiography" it is stated that the real name of "Mercator," of "projection" fame, was Gerard Kauffmann. In a recent number, however, of the popular German journal, the *Gartenlaube*, there is a woodcut of Mercator, taken from an old sketch, under which is the legend—*Gerard Kremer genannt Mercator*. Now, as the word Kremer, or Krämer, means a small retail shopkeeper, the Latin pseudonym is equally applicable, although there is an appreciable difference, meaning excluded, between the two German surnames.

J. C. G.

Our Natural History Collections

In your recent articles on "Our Natural History Collections," in which you criticised the Act of Parliament just passed authorising the removal of the natural history collections in the British Museum, I was surprised not to find any mention of the third clause, which inaugurates a new and enlightened policy in the disposal of duplicates. The clause was inserted at the instigation of Mr. A. J. Mundella, M.P., and Mr. J. Chamberlain, M.P., and is as follows:—"The trustees of the British Museum may also give away any duplicate works, objects, or specimens not required for the purposes of the museum, provided always that the powers hereby conferred shall not extend to any duplicate works in the royal library of King George IV., or in the Crackerode, Grenville, or Banksean libraries, or to any objects presented to the museum for use or preservation therein."

This important departure from the previous holdfast policy of the British Museum will be hailed with delight by all provincial students of natural history, as will also the paragraph in Prof. Sir C. Wyville Thomson's report to the British Association, referring to the disposal of the *Challenger* collections (*vide* Nature, vol. xviii. p. 534).

Public museums are springing up all over the country, and any one acquainted with them knows well the difficulty of forming a natural history collection properly suited to educational requirements. If the power now conferred on the trustees of the British Museum is wisely and liberally used, I think as much material will be found stored away as will furnish provincial museums with the specimens required to make them educationally valuable.
E. H.

Sheffield, September 26

OUR ASTRONOMICAL COLUMN

Biela's Comet.—The great swarm of meteors through which the earth passed on the evening of November 27, 1872, and which were found to be moving in the orbit of Biela's comet, must have been descending to a perihelion passage one month later, or about December 27·6 G.M.T. The comet not having been observed as such since the autumn of 1852, when both parts into which it was separated in 1846 were recovered, we may take this date as a new point of departure, assuming for the present that in following the great assemblage of meteoric bodies seen in November, 1872, we are following what now remains of the comet.

Hubbard's elements of the S. F. nucleus of 1852, with Michez's perturbations by Jupiter and Saturn, give the following elements for 1866, the latest year to which perturbations have been calculated:—

Perihelion Passage, 1866, January 27·6968 G.M.T.

	°	′	″
Longitude of perihelion	109	39	48
,, ascending node	245	43	42
Inclination	12	22	3
Angle of eccentricity	48	46	19·4
Log. semi-axis major	0·5505333		

We know that the comet did not arrive at perihelion at or near the above date in 1866, and hence that disturbance of its motion from an undiscovered cause must have taken place some time in the interval 1852–66. The period of revolution belonging to this orbit is 2445·67 days. There is no reason to suppose that the swarm of meteors is revolving in a shorter period, and we may consequently assume that it will not be again in perihelion before the date, which this period will give, if reckoned from December 27·6, 1872, or September 8, 1879; how much later the perihelion passage may fall it is impossible to foresee. We refer to this point on the present occasion with the view to suggest that a close watch for meteors of the Biela-comet stream should be instituted when the earth again passes the descending node of the comet's, orbit on November 27 next. With perihelion passage on September 8, 1879, the main cometary body would be in a true anomaly of −135° 15′. On December 6, 1798, when Brandes witnessed a great meteoric display, as the earth traversed the comet's orbit, it was in a true anomaly of about −103°, but in 1838, when under similar conditions meteors were observed in large numbers in Europe, Asia, and America, December 5–8, the comet's true anomaly was about −128°.

As regards the recovery of the comet in 1879, though perhaps not hopeless, a very strict examination of the

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heavens in the neighbourhood of its projected track with considerable optical power may be necessary, and it will be particularly a case where the Astronomer-Royal's principle of mounting involved in his "orbit-sweeper" might be brought into useful requisition.

ENCKE'S COMET.—Mr. John Tebbutt, of Windsor, New South Wales, announces his re-observation of the comet of Encke, in the evening twilight on August 3, with the aid of the late Dr. von Asten's ephemeris, which had reached him on July 22. On August 5 it was pretty bright in a 4½-inch refractor, notwithstanding the moonlight, and Mr. Tebbutt hoped to secure a good series of positions. This comet has not passed unobserved at any appearance since its periodicity was discovered by Encke nearly sixty years ago.

BRORSEN'S COMET.—Prof. Schulze, of Döbeln, has published an ephemeris of Brorsen's comet of short period for the reappearance in 1879, founded upon a new discussion of the observations at the last two returns, and the application of the perturbations of Venus, the Earth, Mars, Jupiter, and Saturn. The comet will arrive at perihelion on March 30, and at its least distance from the earth on May 9, about which time its north declination will exceed 65°, so that it will be very favourably situated for observation in these latitudes. Prof. Schulze thinks the comet may be detected at the southern observations before the end of February.

NEW MINOR PLANETS.—Two new minor planets have been added to the list: the first detected by Prof. Peters, at Clinton, U.S., on September 18, the second by Prof. Watson, at Ann Arbor, on September 22—thus raising the number of known members of the group to 190.

AUGUSTUS HEINRICH PETERMANN

WE regret to record the sudden death, at Gotha, on September 26, of Dr. Augustus H. Petermann, one of the first cartographers of the present day. He was born at Bleicherode, in the neighbourhood of Nordhausen, Prussia, April 18, 1822. Although destined by his parents for the church, a pronounced taste for geographical study led to his entrance, at the age of seventeen, into the Geographische Kunstschule, founded shortly before at Potsdam, by Berghaus. Here, under the guidance of this famous geographer, he made rapid progress, and soon attracted the attention of leading *savants*. Among others Humboldt became interested in him, and entrusted him, when but nineteen years of age, with the preparation of the map accompanying his well-known work on Central Asia. Four years later, in 1845, he went to Edinburgh, in order to assist in the preparation of the English edition of the great Physical Atlas of Berghaus, issued by Johnston. Accompanying Petermann to Edinburgh was Henry Lange (now Dr. Lange, of the Berlin Statistical Bureau). These two, along with the late Keith Johnston, made an interesting tour through the Scottish Highlands, one result of which was a sketch or diagram of the Grampian range by Petermann, which he afterwards, we believe, published in London. In 1847 he settled in London, and was promptly elected into the Royal Geographical Society. His seven years' residence in London (1847-54) was one of continuous activity. Aside from the numerous maps which he executed, he contributed regularly to the *Athenæum* a *résumé* of the progress of geographical discovery, and issued, in union with Thomas Milner, an "Atlas of Physical Geography," and a fine folio atlas to illustrate Barth and Oberweg's travels in Africa. Two other maps which Petermann brought out during his stay in London still maintain their place on Stanford's list—a hydrographical and a population map of the British Islands. It was the publication of these maps, we believe, which enabled him to obtain the favourable notice of Baron Bunsen, who materially assisted Petermann in his progress. His connection with English publishers has always been close, and the last edition of the "Encyclopædia Brittanica" contains a number of admirable geographical articles from his pen. In 1855 he returned to his native land to take the management of Justus Perthes' Geographical Institute in Gotha, where an unlimited field was offered to his restless activity. In the same year he commenced the publication of the *Mittheilungen*, the successor of the *Geographisches Jahrbuch*, started by Berghaus. Under his careful editorship this periodical has become almost indispensable to those desiring to keep *au courant* with the progress of geographical discovery. No small portion of its rich and varied contents, as well as of its finely-executed maps, were due directly to Petermann. As cartographer Petermann was unwearied, and a constant succession of admirable maps have been executed by him during the past twenty-five years. Among these we might mention especially a great part of the magnificent collection forming Stieler's "Grosser Atlas," completed two years since; the map of the United States (1875), regarded by the government officials of that country as the most perfect extant; the maps accompanying the African travels of Barth and Rohlfs; and the lately-issued charts of the Arctic regions and the Turkish empire.

It is, however, chiefly by his criticism, his advice, and his enthusiastic, unwearied support of all attempts at geographical discovery, that Dr. Petermann has rendered his greatest services. Standing practically at the head of European geographers, the depositary of all that was being attempted or had been executed, esteemed and regarded by the authorities of the leading nations, he has enabled, by his personal efforts and wide-spread influence, many of our prominent explorers to find the necessary sinews of war, and successfully realise their plans of travel. Two great departments of geographical exploration have specially possessed his sympathies. The first was that of Arctic exploration, and dates from the interest excited during his residence in England, by the expeditions sent forth in search of Franklin. It was almost entirely due to his exertions that the German government equipped the successive expeditions of Werner (1865), Koldewey (1868), and Koldewey and Hegemann (1869), all of which aimed at the exploration of the east coast of Greenland—Petermann's favourite route for approaching the Pole. His advice was likewise of material assistance in the preparations for the late Austrian, English, Dutch, and Swedish expeditions, and few voyages to the icy regions have been undertaken of late years without consultation with Petermann on the general plan.

A still deeper interest was shown by him in the matter of African travel. The important expedition of Barth, Overweg, and Vogel, in 1849, was instituted by the Prussian Government, chiefly on the recommendations of Bunsen and Petermann. Heuglin's and Munzinger's expedition in 1861 was also due entirely to his instigation. Rohlfs' journey in Morocco, as well as Mauch's expedition in South Africa, would have been impossible without his assistance, and his name is closely associated with the important expeditions of Schweinfurth and Nachtigal.

The numerous contributions of Petermann to geographical literature are contained in the *Mittheilungen*, with the exception of those published in English. Of late years he has occupied the chair of geography at the Gotha Polytechnic.

As we have said, the *Geographische Mittheilungen* has become indispensable to all who wish to keep pace with the progress of geography; and from its pages a fair idea may be obtained of the all-comprehensiveness of that department of knowledge. We are glad to learn, from a circular signed by Dr. Behm, the efficient colleague of Petermann, that this *facile princeps* of geographical

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